



# FORMULATION AND EVALUATION OF POLYHERBAL FACEWASH

Vishakha Magar\*, Vidya Katake, Shreyash Patil, Rohini Khedkar, Arundhati Giri.  
Elixir Institute of Pharmacy warwadi, Pune , India

**Abstract :** Acne vulgaris is a continual, inflammatory skin situation of pilosebaceous devices. The standard remedy involves topical and oral antibiotics, retinoids, benzoyl peroxide, and different synthetic compounds, commonly related to destructive consequences. Hence, natural skincare products are taken into consideration nowadays. Acne is a chronic inflammatory ailment of pilosebaceous unit, which entails increased sebum manufacturing by way of sebaceous glands and abnormal desquamation of hair follicles arise in response to growing androgen stages with the onset of puberty. Obstruction of follicles causes follicular distention which is regularly accompanied by the proliferation of the bacteria *Propionibacterium acnes* and the activation of an inflammatory reaction. The gift paintings aimed to prepare the face wash gel containing Thai herbal extract. The plants have been stated inside the literature having suitable anti-microbial, anti-oxidant and anti-inflammatory interest.

Prepared formulation was evaluated for diverse parameters like colour, appearance, consistency, pH, viscosity, balance research and purchaser recognition test. Results confirmed that the gels had been non-irritant. The efficacy when tested with a popular turned into almost equal to that of polyherbal gel. Concluded that from this have a look at, extract was proved to be stable and taken into consideration as an effective natural formula for pimples treatment.

**IndexTerms** - Anti-inflammatory, pH, viscosity, consistency, polyherbal.

## INTRODUCTION

The herbal recovery has been stated from the ancient technology, from Vedas, or even from historic spiritual paintings. Probably it is the oldest medical care device in the world. The herbal healing deals with use of herbs, herbs extracts or herbal merchandise for the betterment of fitness circumstance. Nowadays in westerns countries medical practitioners and typically prescribing drug treatments containing plant extract. Developed nations additionally appreciating this conventional and ancients shape of medicine. As a result, Indian natural tablets are in call for and witnessing rapid increase in worldwide market. Wide boom and demand for herbal treatments, natural pores and skin care products and even herbal cosmetics have been found in current years.<sup>[1]</sup>

Face skin is the important part of the body. It shows the health of individuals. So that the balance nutrition ur required for the skin for keep it healthy, soft, fresh etc. This is the aim of our herbal cosmetic facewash formulation. Women are conscious about beauties and they wanted to increase their own beauty.<sup>[2]</sup> In addition, allopathic medicinal drugs for pimples can be poisonous for body tissue and organic activities of the frame.<sup>[3]</sup> Ayurveda makes use of herbs containing natural phytoconstituents to make the skin care merchandise that guard the skin from external effects without inflicting any unfavourable effects.<sup>[4]</sup> Several natural herbal sources consisting of neem, aloe, tulsi, amla, papaya, ginger, pumpkin seeds, pomegranate seed, luffa *Cylindrica* seed, tea tree, turmeric and eucalyptus are discovered to be safe and powerful in treating one-of-a-kind pores and skin-related infections.<sup>[5]</sup> Multiple skincare and cosmetic products of herbal formulations are mentioned to be drastically effective in reducing pimples vulgaris. The 3 major residences of herbal merchandise consist of antioxidants, smoothing, and moisturizing belongings. The antioxidant components will inhibit growing old and inflammatory outcomes of pores and skin by way of diminishing the presence of loose radicals. Similarly, the moisturizing property will impart cooling effect collectively with improved pores and skin smoothness. It also makes a speciality of repairing the epidermal barrier to reduce trans epidermal water loss and prevent the pores and skin from dehydration.<sup>[6]</sup>

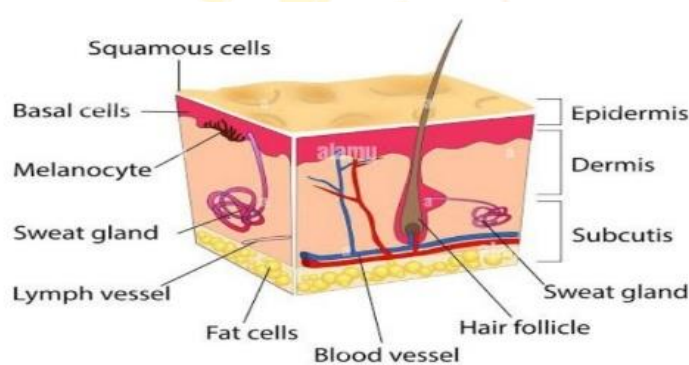
In 2010, a scientific evaluation for the Global Burden of Disease takes a look at suggested pimples as the eighth maximum everyday ailment international.<sup>[7]</sup> Pathogenesis of acne vulgaris is involved inside the 4 inter-related process inclusive of:

- inflammation
- odd losing of follicular epithelium
- follicular colonization by *Cutibacterium*
- acnes and sebum overproduction.

The overproduction of sebum can be precipitated both by using high levels of androgen hormones or by using extended sensitivity of sebaceous gland to the everyday tiers of androgen hormones.<sup>[8]</sup>

The following are some of the risk factors that may influence for developing acne:

- Young human beings are maximum at chance for growing zits during puberty. During this time, the frame undergoes drastic hormonal modifications.
- These hormones can cause oil production, main to an accelerated hazard of pimples.
- Hormonal acne associated with puberty generally subsides while a teen reaches maturity. Acne lesion implies whiteheads, blackheads, small bumps, nodules and cysts.
- Despite acne is essentially a normal physiological incidence, the following distinguished conditions may make worse its state.
- Fluctuation of hormone stages of girls at the time of menstruation.
- Disturbing the pimples lesions with the aid of choosing or prodding or infrequently press them.
- Covering especially overall brow and face with Clothing, hats and sports helmets and so on, which badly press the pimples lesions.
- Better to keep away from pizza, greasy and fried foods, and junk foods which are not at all excellent for usual fitness, regardless of the truth that they don't create acne or make it worse.
- Excessive washing to cast off dust from acne can dry and irritate the pores and skin. So basically, mild wash ought to be desired.
- Pressure over the zits to be definitely prevented.
- In positive sufferers zits can also occur from heredity or can aggravate them.



**Fig No. 1 Skin structure**

#### NEED OF THE STUDY.

Herbal Cosmetics: Explore the trend and benefits of herbal ingredients in cosmetics.

Polyherbal Formulation: Explain why combining multiple herbs can enhance efficacy and provide synergistic benefits.

#### Materials and methods:

*Table no. 1: Formula and uses for facewash*

Ingredients	Quantity	Use
Pumpkin seed oil	1.25 ml	Anti-aging Moisturizing
Pomegranate seed oil	1 ml	Reduce scarring Wound healing
Luffa Cylindrica oil	1.25 ml	Antioxidant
Lavender oil	0.25 ml	Antibacterial Heal acne
Turmeric oil	0.25 ml	Antibacterial Antiseptic <sup>[9]</sup>
Tea tree oil	0.25 ml	Treats itching, oily skin, acne

Cinnamon oil	0.25 ml	Antioxidant Antibacterial
Propyl paraben	0.75 gm	Preservatives
Carbopol 974p	3 gm	Gelling agent
Propylene glycol	4 ml	Humectant
Sodium lauryl sulphate	5 gm	Foaming agent
Xanthum gum	0.5 gm	Thickening agent
Triethanolamine	3 ml	pH enhancer

## 1. Pumpkin seed oil



**Fig No. 2 Pumpkin seeds**

Pumpkin seeds oil is a tremendously wealthy supply of numerous bioactive compounds having purposeful residences used as safe to eat oil or as a capability nutraceutical. In current years, several studies have highlighted the clinical homes of pumpkin relations seed oil that is known as strongly dichromatic viscous oil.<sup>[10]</sup> Researchers have to date targeted in particular at the composition and content of fatty acids, tocopherols and sterols in pumpkin seed oil because of their superb health result.<sup>[11-13]</sup> Good high-quality, organic pumpkin seed oil is rich in nutrients A and C, zinc, antioxidants and unsaturated fatty acids. These benefits make pumpkin seed oil a extremely good moisturizer for shiny skin sorts, mainly when you battle with zits. The oil additionally firms the skin and has anti-getting old properties.

### Uses

- Supports wound healing.
- Supports manufacturing of collagen. Pumpkin seed oil's nutrition C content material helps the manufacturing of collagen, which facilitates pores and skin retain elasticity and firmness.
- Reduces free radicals and balances oil in the skin.

## 2. Pomegranate seed oil

Stimulate keratinocyte proliferation, moderate thickening of dermis, stimulating keratinocyte proliferation, stimulating kind I procollagen synthesis, inhibiting matrix metalloproteinase-1.<sup>[14]</sup> Inflammation plays a critical role in developing acne. The antioxidants found in pomegranate neutralize unfastened radicals that damage cells and tissues, inflicting irritation inside the frame. The vitamin C content material also allows in regulating the production of sebum, an oily secretion which might also motive acne.



**Fig No. 3 Pomegranate seeds**



### Uses

- Pomegranate seed oil has both sturdy antioxidant and anti-inflammatory properties, which may also make it beneficial in assisting decrease symptoms of ageing including wrinkles and dark spots. "And, in one observe, a compound with pomegranate seed oil become proven to enhance the increase of pores and skin cells and enhance skin hydration and elasticity.
- It can help skin hydration. Perhaps one in every of its maximum famous benefits is hydration: Pomegranates make for a star hydrator. "It incorporates puniceic acid, an omega-five fatty acid that facilitates to hydrate and save you moisture loss," says King. "And it helps to help the skin barrier."
- Pomegranate seed oil is wealthy in fatty acids, which enables your skin look greater hydrated, plumper. The oil can also nourish and melt dry, cracked pores and skin—and additionally assist redness and flakiness. Additionally, pomegranate seed oil works outstanding as an emollient for the pores and skin and enables with eczema and psoriasis—but it can additionally moisturize pimples or oily pores and skin without clogging the pores." Essentially it is a hydrating aspect that blessings all skin kinds!
- It can assist manage inflammation. Antioxidants work by neutralizing unfastened radical damage in the pores and skin, which in flip eases inflammation. By using antioxidants constantly, you could help control infection long time—specifically the sneaky microscopic, low-grade inflammation known as inflammation.
- Antioxidants can provide sun and pollutants protection. Antioxidants, among their many other obligations, offer environmental safety against stressors, UV damage, and pollution. "Rich in antioxidants, it allows guard the pores and skin from damage from unfastened radicals from UV rays and pollution," says King.

### 3. Luffa Cylindrica oil

The Luffa cylindrica possesses numerous pharmacological sports such as antioxidant, anti-inflammatory, antibacterial, wound recuperation, and many extra. The biologically energetic issue purporting to have skin care benefits and can be used in products consisting of moisturizers, anti-getting older, anti-inflammatory cream, facial purifier, body oil, sponge cleaning soap, and so forth. The goal of this article of Luffa cylindrica is to attention on beauty significance and its benefits.<sup>[15, 16]</sup>



**Fig No. 4 Luffa Cylindrica**

### Uses

- Luffa Cylindrica oil is used cosmetics to provide a softer and smoother skin.
- It is a plant fabric that comes from the fruit of the herbal vegetable sponge, luffa cylindrical, and looks as if a cucumber.
- Luffa or loofah are already part of splendour and skin treatment, often used as bath sponges for their mild exfoliating houses.
- The luffa cylindrica dried seeds are pressed to provide the oil.
- The oil from this seed is an incredible lubricant, and externally used for shingles and boils, leprosy and skin diseases.
- The seed is an expectorant and used in dysentery.
- Luffa cylindrica is used for its antifungal, anti-tumour and anti-inflammatory residences.

### 4. Lavender oil

Lavender oil has been showing effective antifungal agent against the fungi of medical and cosmetics importance specially inhibition of germ growth.<sup>[17]</sup> Lavender essential oil is famous as a complementary medicinal drug in its personal right and as an additive to many over the counter complementary medicinal drug and cosmetic merchandise.<sup>[18, 19, 20]</sup>

### Uses

- Lavender oil for blotchy skin lavender oil can usefully resource in evening skin tone since it reduces inflammation.

- It can lessen discoloration, which includes darkish spots. Lavender oil helps reduce blotchiness and redness. If you have got hyperpigmentation for your skin, lavender oil may be capable of assist with that as properly.
- Lavender oil for face wrinkles Free radicals is partly chargeable for great strains and wrinkles at the face. Lavender oil is full of antioxidants, which help shield you from the loose radicals.
- To use lavender oil for wrinkles, use a few drops of the important oil along with coconut oil. The mixture may be used as a moisturizer a few times a day.
- Anti-inflammatory capacity Painful irritation can be dealt with lavender oil. The oil's ache-relieving and numbing results help soothe the irritation, at the same time as the beta-caryophyllene inside the oil additionally acts as a natural anti-inflammatory.



**Fig No. 5 Lavender oil**

## 5. Turmeric oil

Rhizomes of turmeric plant contain 3-5% risky oil with particular aromatic characteristics. Curcumin is the main biologically energetic curcuminoid phytochemical compound of turmeric that's accountable for yellow colour of the foundation. In truth, it is the curcuminoids that possess all of the bio-shielding residences in turmeric.<sup>[21]</sup> Turmeric has long been used as an effective anti-inflammatory in both the Chinese and Indian structures of remedy.<sup>[22]</sup> Turmeric is also documented to have wound restoration capacity.<sup>[23]</sup> The *Curcuma longa* is a local plant of southern Asia and is cultivated significantly for the duration of the hotter parts of the world. It belongs to family Zingiberaceae.



**Fig No. 6 Turmeric**

### Uses

- Treating cracked heels.
- Skin rejuvenator.
- Eliminating signs and symptoms of growing old.
- In facial masks.
- Relieving infection.
- Defeating dandruff.
- Curbing hair loss.
- Treating scalp situations.

## 6. Tea tree oil

When Tea tree oil is blended right into a cosmetic and applied to the skin, it will help to resolve any fungal, bacterial in addition to viral infections - and might therefore be used for a variety of issues - ranging from boils, abscesses, acne, chew wounds from animals and human beings, dandruff and different scalp problems and is also powerful to assist kind out mattress sores, diaper rash or every other rash.<sup>[24]</sup> When it's far introduced to the water for laundry it has great value to deal with abscesses, mattress

sores, acne, boils, lice, dandruff, wounds, as nicely as animal or human bites and also can be applied neat on trouble regions with a cotton bud. For lice - practice neat onto the scalp - leave for forty mins and wash the hair. This need to be repeated every 2d day for twelve days. Fungal outbreaks inclusive of athlete's foot and nail infections in addition to vaginal thrush and cradle cap can be handled with common direct utility of a 2.5% dilution of tea tree oil.<sup>[25]</sup>



**Fig No. 7 Tea tree oil**

#### Uses

- **Dry skin and eczema**  
Tea tree oil can help soothe dry pores and skin by decreasing itching and inflammation. Also, it's been shown Trusted Source to be extra effective than zinc oxide and clobetasone butyrate creams in treating eczema.
- **Oily pores and skin**  
The antiseptic houses of tea tree oil might also make contributions to its capability to fight oily skin. A small 2016 study located that individual who used a sunscreen containing tea tree oil for 30 days showed upgrades in oiliness.
- **Itchy skin**  
The anti-inflammatory properties of tea tree oil make it useful in relieving the soreness of itchy skin. It soothes the skin and can also help heal infections that purpose itchy pores and skin.
- **Inflammation**  
The anti-inflammatory impact of tea tree oil allows to appease and relieve painful and indignant skin. It may additionally assist to reduce redness and swelling.

## 7. Cinnamon oil

The evolution of cosmetology is, in recent years, extensive, specifically by means of the number of recent substances and new formulations that seem and through the stress of an increasing number of more potent guidelines. The cosmetic product is no longer that product that owed the whole lot to the artificial, the false-semblant with a view to deliver the phantasm of a truth or as an alternative to hide this truth. Cosmetology has turn out to be a science, primarily based on specific data of a biological and physicochemical nature, and this new theory has truly been imposed.<sup>[26, 27, 28]</sup> Cinnamon Oil is a beneficial element for a natural face wash intended to enhance skin health by using decreasing irritation, redness, and swelling while also getting rid of dangerous bacteria, stopping pimples, and soothing infections.



**Fig No. 8 Cinnamon oil**



### Uses

- Cinnamon Oil is a useful element for a natural face wash intended to beautify skin fitness with the aid of lowering infection, redness, and swelling whilst additionally getting rid of harmful microorganism, stopping acne, and soothing infections.

## 8. Propyl paraben

Propylparaben has been used broadly and correctly as a preservative (to prevent the growth of harmful microbes that is a cause of adverse fitness results) in beauty, meals and pharmaceutical preparations round the world for greater than 50 years.

## 9. Carbopol 974p

The quite simply water swellable Carbopol polymers are used in a various range of pharmaceutical applications to provide Controlled launch in drugs, Bio adhesion in buccal, ophthalmic, intestinal, nasal, vaginal and rectal packages.<sup>10</sup> Thickening at very low concentrations to provide a wide range of viscosities and drift properties in topical, lotions, creams and gels, oral suspensions and transdermal gel reservoirs.

## 10. Propylene glycol

Propylene glycol is utilized in beauty formulations as a pores and skin conditioning agent humectant, viscosity decreasing agent, solvent, or fragrance ingredient. The PPGs function by and large as skin conditioning dealers, with a few functioning as solvents. Tripropylene glycol features as a humectant, antioxidant, or emulsion stabilizer.<sup>[29]</sup>

## 11. Sodium lauryl sulphate

Studies have shown coupling sodium lauryl sulphate and ceramides in pores and skin remedies facilitates to top off and address pores and skin dryness and barrier disruption. With its position in rebuilding the pores and skin's surface, sodium lauryl sulphate can be considered a useful method for bolstering usual skin nice and appearance.

## 12. Triethanolamine

Triethanolamine is determined in skin care and cosmetic products including moisturizers, eyeliners, mascaras, hair care, and sunscreens. It stabilizes and will increase the pH of products to improve the way they experience and have interaction with the pores and skin. The compound is used to make surfactants in business and cosmetics as a pH adjuster for skin and hair conditioning products as well as solar screen lotions, liquid laundry detergents, polishes, and paints.

## 13. Xanthum gum

Xanthan gum is a herbal product which is non-toxic and non-aggravating. It can be utilized in combination with different thickeners and stabilizers to improve texture, drift conduct, stability and look. All those residences make xanthan gum a totally powerful thickening and stabilizing agent for cosmetics and toiletries.

## Procedure for formulation

1. Take three beakers that is A, B, C.
2. Take a beaker (A) and add 3gm of Carbopol 974p then add a water with continuous stirring it forms a Carbopol gel. After formation of gel keep it aside.
3. Take a beaker (B) and add 50ml of water then add propylene glycol, propyl paraben with continuous stirring. Then add 5gm of sodium lauryl sulphate with continuous stirring. Keep this water phase aside.
4. Take beaker (C) for making oil phase. Add remaining all oils into this beaker. Do not add active ingredient that is pumpkin seed oil.
5. Take a beaker (C) that contains oil phase set this beaker with mixing apparatus for continue mixing after 5 minutes of mixing add the active ingredient that is pumpkin seed oil.
6. Continue the mixing for 5 minutes.
7. Then add the water phase (beaker B) into oil phase (beaker C).
8. Continue the mixing for 10 minutes.
9. After that add 1 scoop of Carbopol 974p gel beaker (A) into above mixture with continue mixing.
10. After 15 minutes add 1 scoop of Carbopol 974p continue the procedure till Carbopol 974p is finished.
11. Switch of the assembly.
12. Take a beaker containing facewash and then proceeds to evaluation tests.



Fig No. 9 Facewash formulation

## Evaluation parameters

### ➤ **Physical appearances** <sup>[30]</sup>

The physical appearance of facewash formulation was observed visually.

### ➤ **Colour** <sup>[31]</sup>

The colour of facewash formulation was checked against White background and the colour of give formulation is yellowish.

### ➤ **Odour** <sup>[32]</sup>

The odour of facewash formulation was checked by manually.

### ➤ **Washability** <sup>[33]</sup>

The facewash formulation was Applied on the skin then it washing with water and checked the washability, it was good.

### ➤ **pH test**

The amount of 100 ml of formulation was taken in beaker and add triethanolamine Dropwise to adjust the PH of formulation with skin PH and measured it by using digital PH meter.

### ➤ **Consistency**

The consistency was checked by applying on skin.

### ➤ **Foamability**

Small amount of formulation was taken in beaker containing water. Beaker was shaken for 10 times & observed the foamability of formulation.

### ➤ **Grittiness** <sup>[34]</sup>

The face wash formulations evaluated microscopically under 40 x magnifications for the presence of any particulate matter.

### ➤ **Spreadability** <sup>[35]</sup>

Spreadability is described in phrases of time in seconds required taken by way of the upper slide to slide off the gel placed between the two slides, beneath sure load. The lesser the time taken for the separation of two slides, the higher the spreadability. An amount of 500 mg of the components became sandwiched between the 2 slides, each with dimensions of 6 cm × 2 cm. A weight of 100 g changed into placed upon the higher slide so that the components among the two slides get forced uniformly to shape a thin layer. The weight turned into removed, and the excess of the formulation adhering to the slides became scrapped off. The decrease slide became constant on the board of equipment, and the higher slide was held to the non-flexible string to which 20g load became carried out with the assist of a simple pulley which changed into in horizontal stage with the constant slide. The time taken by using the top slide to slide off the decrease slide become mentioned

### ➤ **Viscosity** <sup>[36]</sup>

Viscosities of formulated gels have been determined the usage of Brookfield viscometer spindle # 7 at 50 rpm and 25°C. The corresponding dial reading on the viscometer become referred to. Then the spindle turned into decreased successively. The dial studying became improved by way of the thing noted in catalogue.

### ➤ **Homogeneity** <sup>[37]</sup>

Under visible inspection of the organized formulation indicated no lumps and to have uniform coloration dispersion, loose from any fibre and particle.

**Table No. 2 Evaluation parameters and observation**

Sr. No.	Evaluation parameters	Observations
1	Physical appearance	Good
2	Colour	Yellowish
3	Odour	Characteristics
4	Washability	Easily washable
5	PH test	5.08



6	Consistency	Semisolid
7	Foamability	Good foam appears
8	Grittiness	No particulates matter
9	Spreadability	3 gm.cm/sec
10	Viscosity	4404.5 cps
11	Homogeneity	Uniform



Fig No. 10 Colour



Fig No. 11 Washability



Fig No. 12 pH test

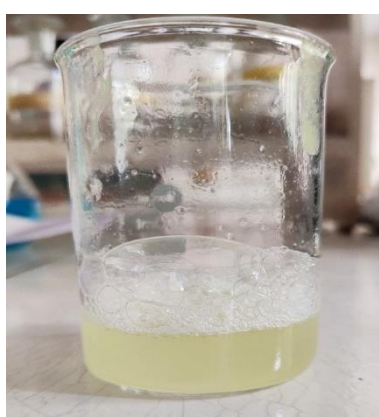


Fig No. 13 Foamability



Fig No. 14 Consistency



Fig No. 15 Spreadability



Fig No. 16 Viscosity test

### Summary and conclusion

The herbal face wash was prepared by using pumpkin seed oil, pomegranate seed oil, lavender oil, luffa Cylindrica oil, tea tree oil, turmeric oil, Cinnamon oil etc. The herbal face wash is more efficient and safer as compared to the marketed face wash. At this formulation contains all herbal ingredients it neither produces any harmful action on skin and are reliable. Preferably they are used for all skin types. Herbal face wash not only moisturised but also, they are used as a cleanser.

The world market is likewise transferring towards poly natural drugs for fitness care, health and for cosmetics functions together with dermal arrangements like face washes gels anti zits arrangements and many others. A survey of worldwide skin care marketplace traits shows that purchaser use of natural products has notably multiplied over the past years. In the present examine, a try changed into made to formulate poly herbal anti pimples face wash gel the usage of specific natural components like noticed pomegranate seed oil, pumpkin seed oil, tea tree oil, turmeric oil, lavender oil, luffa cylindrica oil, cinnamon oil and to assess the prepared formulations for the desired parameters. Prepared formulations polymers were evaluated for bodily parameters like shade, smell, grittiness, greasiness, PH, viscosity, consistency, spreadability, wash potential, skin inflammation test and stability research. Sago gum produces desired gel electricity to formulations. Honey produces humectants pastime at some point of stability research.

### References

1. Rashmi MS. Topical gel: A review. Pharm Rev, 2008; 6:1–3.
2. Kubo I, Muroi H, Kubo A Naturally occurring Antiacne agents , J nath production 1994, 9-17 .
3. Alzohairy MA. Therapeutics role of Azadirachta indica (Neem) and their active constituents in diseases prevention and treatment. Evid Based Complement Alternat Med. 2016.
4. Pal RS, Pal Y, Saraswati N, et al. Current review on herbs for derma care. Open Dermatol J. 2019;41-46.
5. Ahuja A, Gupta J, Gupta R. Miracles of herbal phytomedicines in treatment of skin disorders: natural healthcare perspective. Infect disord Drug Targets. 2021;328–338.
6. Sowmya KV, Darsika CX, Grace F, et al. Formulation and evaluation of a polyherbal face wash gel. WJPPS. 2015;585-588.
7. Vos T, Flaxman AD, Naghavi M, et al. Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet. 2012;2163-2196.
8. Oge LK, Broussard A, Marshall MD. Acne Vulgaris: diagnosis and treatment. Am Fam Physician. 2019;475-484.
9. Shagufta N, Safia J , Manzoor S, Aslam F and Ali A. 2010. Antibacterial activity of curcuma longa varieties against different strains of bacteria. Pak. J. Bot., 455-462.
10. Stevenson DG, Eller FJ, Wang L, Jane JL, Wang T, Inglett GE. Oil and tocopherols content and composition of pumpkin seed oil in 12 cultivars. J agric Food Chem. 2007;4005–13.
11. Procida G, Stancher B, Cateni F, Zacchigna M. Chemical composition and functional characterisation of commercial pumpkin seed oil. J Sci Food Agric. 2012;1035–41.
12. Nawirska-Olszańska A, Kita A, Biesiada A, Sokół-Łętowska A, Kucharska AZ.Characteristics of antioxidant activity and composition of pumpkin seed oils in 12 cultivars. Food Chem. 2013;155–61.
13. Rabrenovic BB, Dimic EB, Novakovic MM, Tesevic VV, Basic ZN. The most important bioactive components of cold pressed oil from different pumpkin (Cucurbita pepo L.) seeds. LWT Food Sci Technol. 2014;521–7.
14. Aslam MN, Lansky EP and Varani J: Pomegranate as a cosmeceutical source: pomegranate fractions promote proliferation and procollagen synthesis and inhibit matrix metalloproteinase-1 production in human skin cells. Journal of ethnopharmacology 2006; 311-318.
15. Bulbul IJ, Zulfiker A, Hamid K, Khatun H and Begum Y. Comparative study of in vitro antioxidant, antibacterial and cytotoxic activity of two Bangladeshi medicinal plants Luffa cylindrica L and Luffa acutangula. Pharmacognosy Journal, 2011; 59-66.
16. Ahmad B and Khan AA. Antibacterial, antifungal and phytotoxic activities of Luffa cylindrica and Momordica charantia. Journal of Medicinal Plants Research, 2013;1593-1599.
17. Daferera DJ, Ziogas BN, & Polissiou MG. GC-MS analysis of essential oils from some Greek aromatic plants and their fungitoxicity Penicillium digitatum. J Agric Food Chem 2000; 2576-2581.
18. Gattefosse R-M. Gattefosse's Aromatherapy. Saffron Walden, England, 1937.
19. Eveleigh T. Lavender. Lorenz Books, Sydney, 1996.
20. Cavanagh HMA & Wilkinson JM. Biological activities of lavender essential oil. J Phyto Res 2002;301-308.
21. Badmaev, V., Majeed, M., Prakash, L. (2004) Curcuminoids: bioactive compounds From turmeric. Sabinsa Corporation, 2.

22. Gescher, A., Sharma, R. and Steward, W. (2005) Curcumin: the story so far. *European Journal of Cancer* 41;1955-1968.
23. Biswas, T.K., Mukherjee, B. (2003) Plant medicines of Indian origin for wound healing activity: A healing review. *International Journal of Lower Extremity Wounds* 2(1): 25-39.
24. Tea Tree Skin Clearing Lotion | The Body Shop ® [Internet], Cited on 11/11/2013, Available from: <http://www.thebodyshop-usa.com/shop-by-line/tea-tree/tea-tree-skin-clearing-lotion.aspx>.
25. The Tea Tree Skin "Miracle" - The 7 Benefits of Tea Tree Oil / All [Internet], Cited on 11/11/2013, Available from: <http://bodyecology.com/articles/tea-tree-skin-miracle.php>.
26. Petitot F, Moreels AM, Paquet F. Evolution of the percutaneous penetration and distribution of uranyl nitrate as a function of skin-barrier integrity: an in vitro assessment. *Drug Chem Toxicol*. 2010;316–324.
27. Rosenbloom AL. Pediatric Endo-Cosmetology and the Evolution of Growth Diagnosis and Treatment. *J pediatrics*. 2011;187–193.
28. Rao JV, Pallela R, Prakash GVSB. *Marine Cosm. Trends Prosp*. 2011;77–103.
29. Gottschalck TE, Bailey JE. *International Cosmetic Ingredient Dictionary and Handbook*. 13th ed. Washington, DC: Personal Care Products Council; 2010.
30. V. V. Paithankar, Formulation and evaluation of herbal cosmetic preparation using safed musli. *International Journal of PharmTech Research*, 2261-2264, (2010). 68.
31. Kubo I., Muroi H., Kubo A., "Naturally occurring anti-acne agents", *J Nat Prod*, 1994;9-17.
32. Ashish Aswal, Mohini Kalra and Abhiram Rout; Preparation and evaluation of polyherbal cosmetic cream; *Der Pharmacia Lettre*, 2013; 83-88.
33. Panigrahi L, Ghosal SK, Pattnaik S, Maharana L, Barik BB; Effect of permeation enhancers on the Release and permeation kinetics of Lincomycin Hydrochloride gel formulations through Mouse skin. *Indian J Pharm Sci.*, 2006; 205-211.
34. Mika Korhonen, Rheological properties of pharmaceutical creams containing sorbitan fatty acid estersurfactants, 2014, 16-22.
35. Mohammad IT, Nair RH, Susan C, Chrisita A. Rheological characterization of topical carbomer gels neutralized to different pH. *Pharm Res* 2004;1192-9.
36. Cunliffe WJ, Goulden V. Phototherapy and acne vulgaris. *Br J Dermatol*. 2000;855–6.
37. Jawaidd Talha, Gupta Rol and Siddiqui Zohaib Ahmed, A review on herbal plants showing antidepressant activity. *International Journal of Pharmaceutical Science and Research*, 2011;3051-3060.
38. Singh H.P., Samhotra N., Gullaiya S., Kaur I., "Anti-acne synergistic Herbal face wash gel Formulation, Evaluation, & Stability study", *World Journal of Pharmaceutical Research*, 2015;1261-1273.

